

## VALUE ENGINEERING PROPOSAL

PROPOSAL NO: C-03

PAGE NO: 1 OF 6

DESCRIPTION: Provide a Land-Side Earth/Stone Berm to the Sheetpile Bulkhead Wall

### ORIGINAL DESIGN:

The current plan provides a steel sheet pile bulkhead wall for three sides of the CDF. Construction steps include pre-dredge unsuitable soils, backfill foundation with granular fill, driving sheetpile cells, and filling the cells. See Drawing No. 1: CDF "D" Alternative A-1 Plan, Drawing No. 2: CDF "D" Alternative A-1 Section.

### PROPOSED DESIGN:

Recommend using a land-side earth/stone berm for the first 500 LF for the north containment berm. Plan A-1 is considered as the base plan for this alternative. Berm slopes may vary from 2H:1V to 3H:1V (actual to be determined). See Drawing No. 1: CDF "D" Alternative A-1 Plan, Drawing No. 2: CDF: "D" Alternative A-1 Section. Keep excavation of unsuitable foundation and backfill of new foundation.

### ADVANTAGES:

1. Land based construction - using end-dump for fill placement of the proposed berm.
2. Would significantly reduce steel sheetpile bulkhead cells.
3. Footprint may fit current area (depends on side slopes), with minimum impact to storage volumes.
4. Faster construction – saves construction dollars and lower life cycle costs (no corrosion).

### DISADVANTAGES:

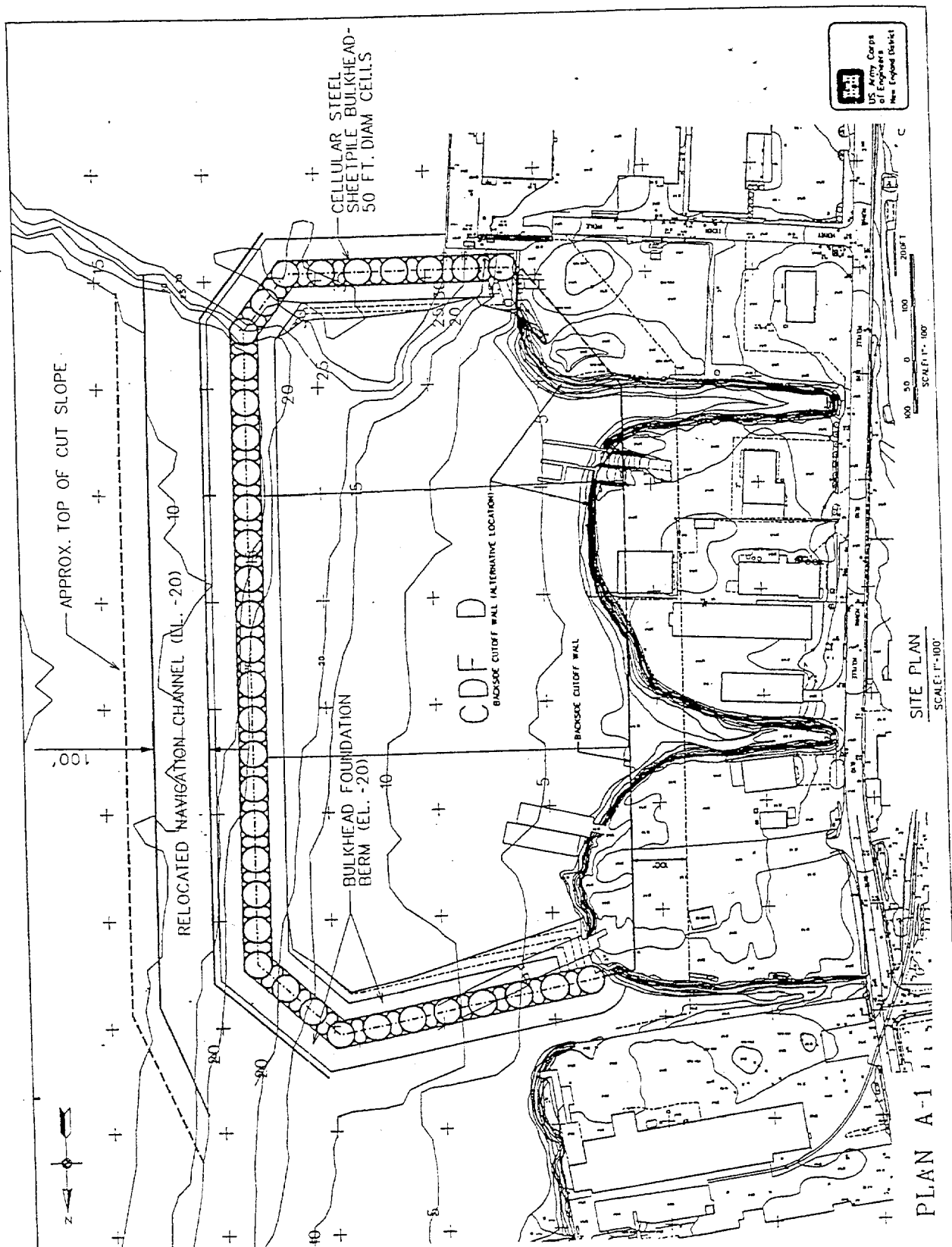
1. Two design solutions are needed – earth/stone berm and sheetpile cells.
2. Some loss of storage volume (27,000 CY).
3. Tying in geomembrane to bulkhead wall for "cut off" wall effect.

### JUSTIFICATION:

The proposed earth/stone berm system can be developed for placement as the north CDF containment wall (500 LF). Issues to be developed include minimizing excavation and establishing the berm slope for the exposed wall (3H:1V vs. 2H:1V). The land based end-dump fill method is simpler and faster than sheetpile cells. A minimum of storage volume is lost. Additional design effort should be well worth the resulting benefits realized. A riprap face has been provided to the exposed face of the berm.

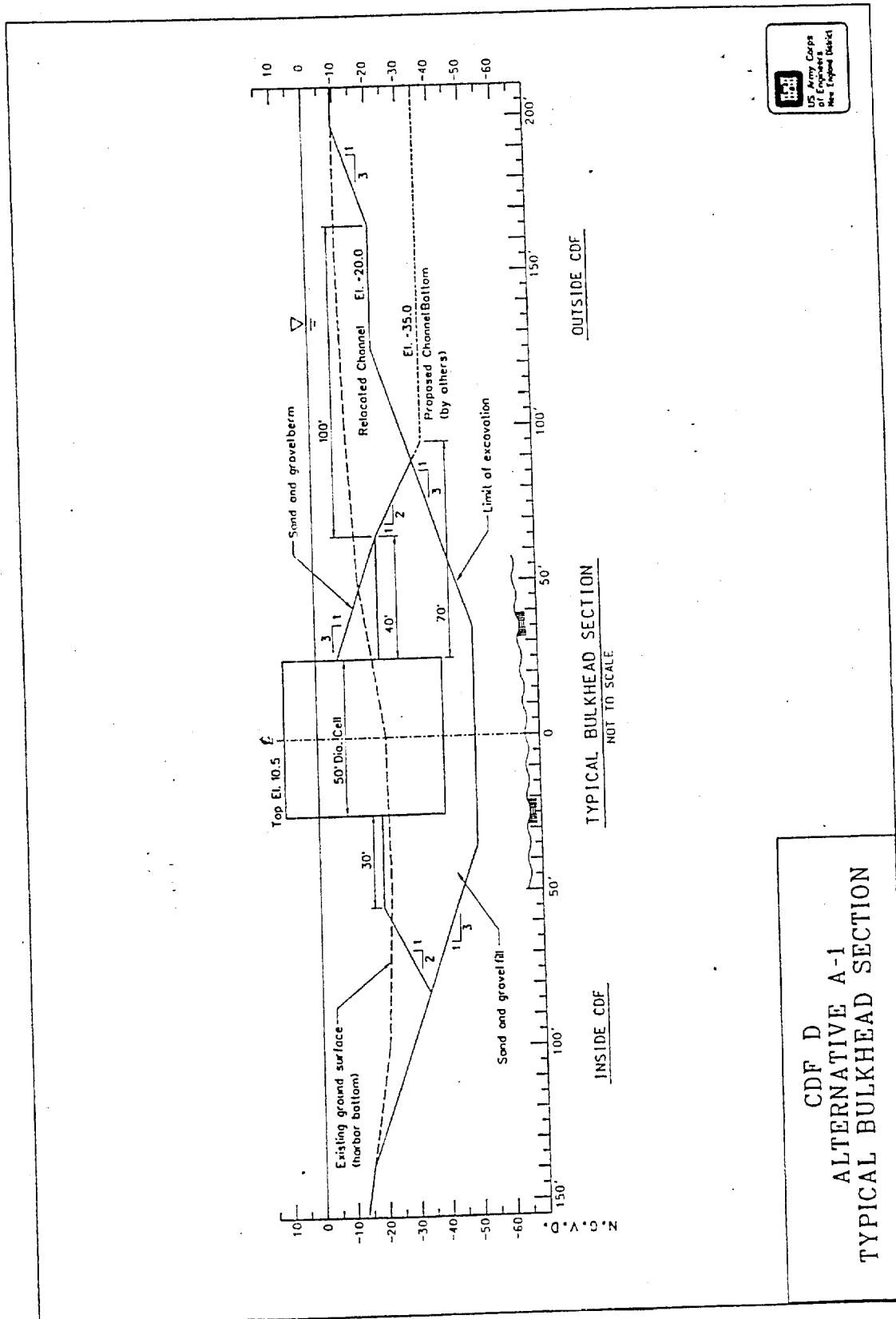
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DRAWING NO. 1: Current CDF "D" Plan A-1



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DRAWING NO. 2: Current CDF "D" Plan A-1 - Section

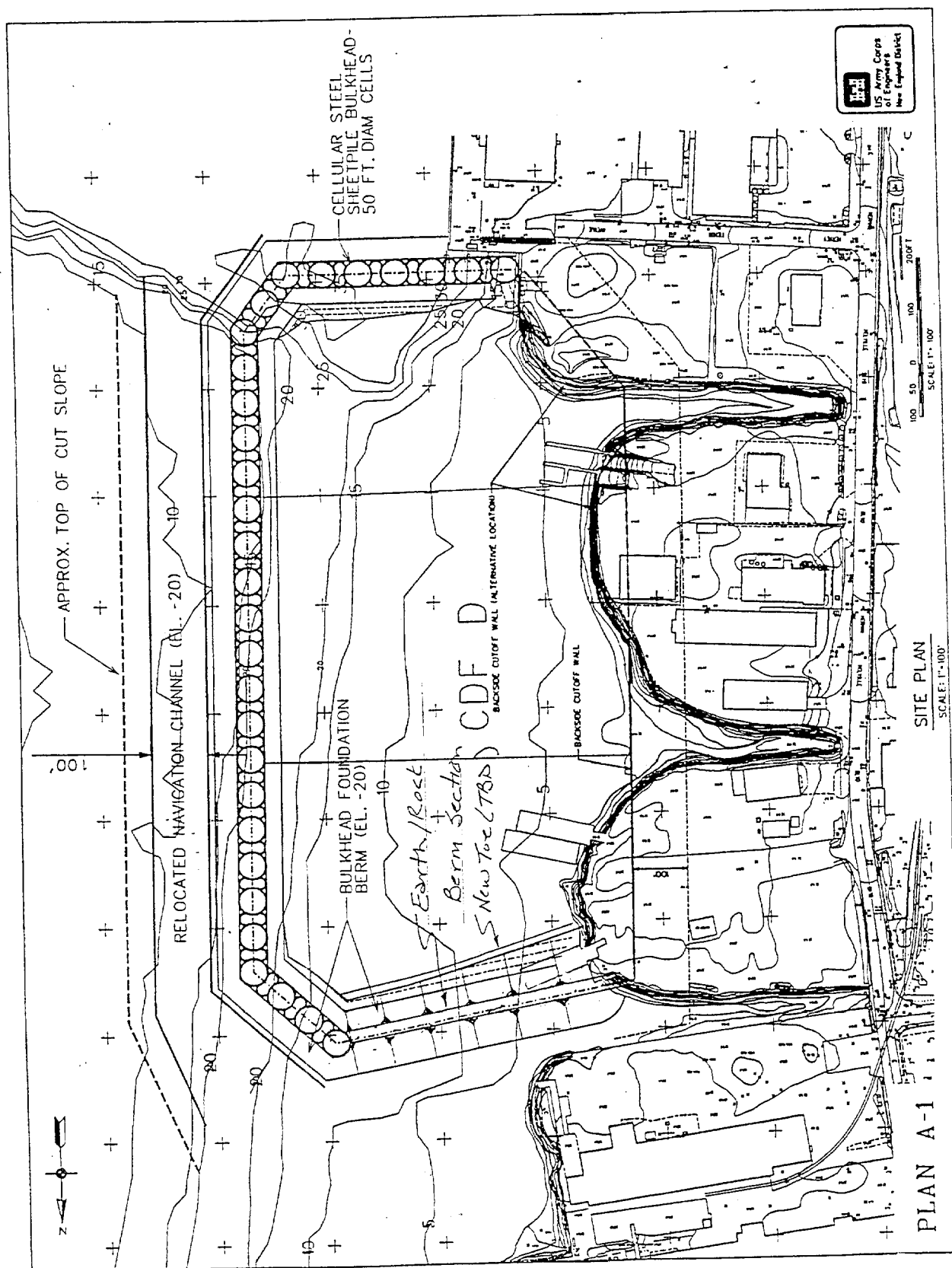


CDF D  
ALTERNATIVE A-1  
TYPICAL BULKHEAD SECTION

DRAWING NO. 3: Proposed CDF "D" Plan A-1

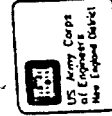
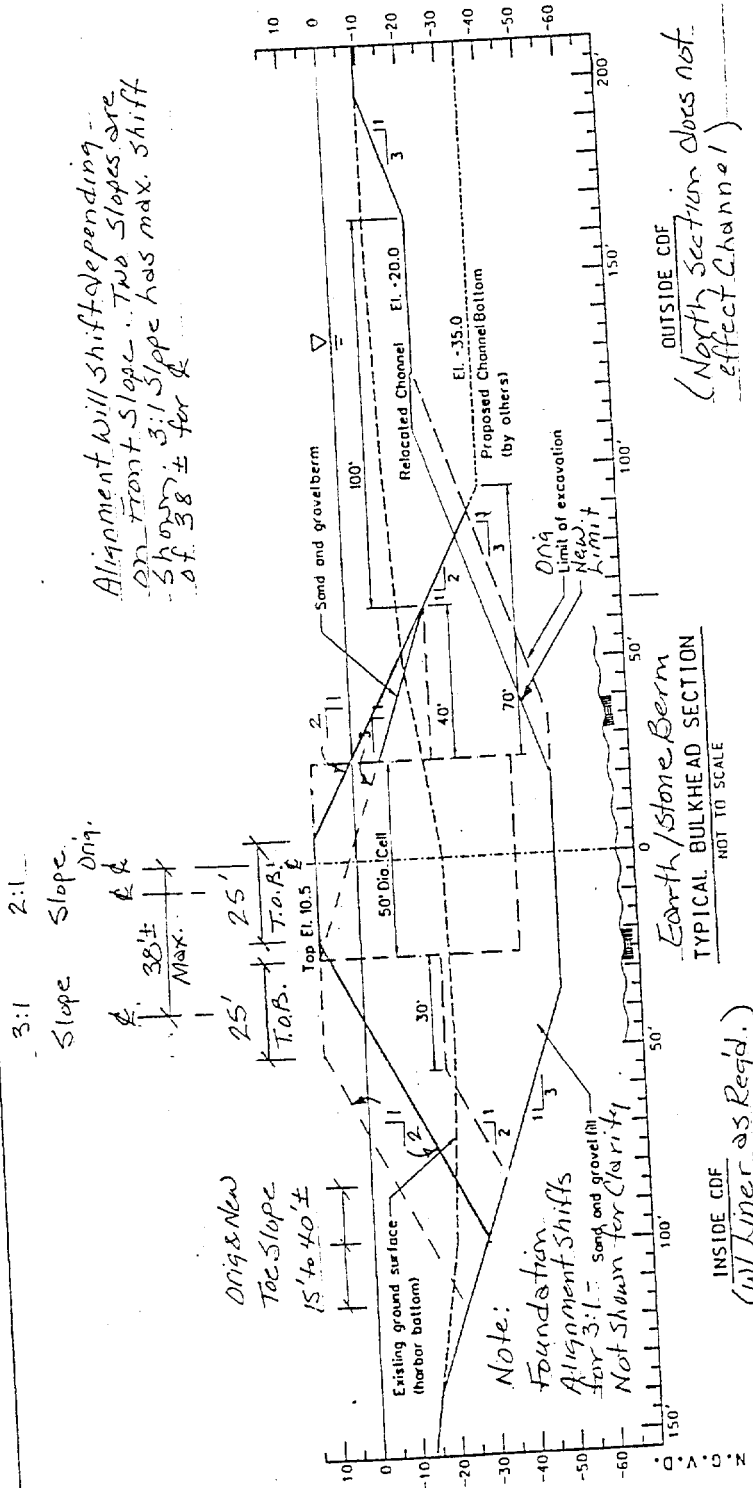
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DRAWING NO. 4: Proposed CDF "D" Plan A-1 - Section(s)



CDF D  
ALTERNATIVE A-1  
TYPICAL BULKHEAD SECTION

COST ESTIMATE WORKSHEET				
PROPOSAL NO.: C-03: Earth/Stone Berm (Plan A-1 used as basis for cost comparison)			PAGE 6 OF 6	
DELETIONS				
ITEM	UNITS	QUANTITY	UNIT COST	TOTAL
Bulkhead Wall- sheetpile cells	%	20	\$17,075,500	\$3,415,100
Cell Fill	%	20	\$2,587,500	\$517,500
Cell Cut off wall	%	20	\$7,050,000	\$1,410,000
Total Deletions				\$5,342,600
ADDITIONS				
ITEM	UNITS	QUANTITY	UNIT COST	TOTAL
Stone Berm	CY	124,000	\$25	\$3,100,000
Compacting/shaping	CY	124,000	\$5	\$620,000
** Geomembrane	SY	85,000	\$10	\$850,000
Riprap Outside Slope	CY	2,600	\$40	\$104,000
Total Additions				\$4,674,000
Net Cost Savings				\$668,600
* Mark-ups			84.00%	\$561,624
Total Cost Savings				\$1,230,224
* Markups include:25% contingency, plus 40% (OH,fee,S&A,SS&H, QC, etc.) plus 5% escalation.				
** \$10/SY used for this installation, considering land based equipment in very shallow water.				

## VALUE ENGINEERING PROPOSAL

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PROPOSAL NO:	C-04	PAGE NO:	1 OF 3
DESCRIPTION:	Install Curtain around Site, Rollover Pre-Dredge and Contaminant Layer into CDF "D"		

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### ORIGINAL DESIGN:

Foundation materials for cellular sheet-pile bulkhead will be excavated and disposed of offsite. Bulkhead will then be back-filled with granular fill.

### PROPOSED DESIGN:

Prior to installation of cellular sheet-pile bulkhead, the foundation (along with side slopes) would be dredged. The dredged material would be stored in CDF "D" storage area. Migration of contaminants would be controlled by a floating silt curtain.

**Basis of estimate is that 200,000 cubic yards (estimated 16,000 cy contaminated and balance being foundation pre-dredge) will be disposed in the compartment.**

### ADVANTAGES:

1. Reduces transportation/haul to disposal.
2. Reduces landfill disposal costs.
3. Reduces transportation/haul traffic.
4. Conserves existing landfill space.

### DISADVANTAGES:

1. Organic material is extremely fluid, large volume will get re-suspended.
2. Organics do not stockpile, they flow and layout level.
3. Trench will likely slough in.
4. Silt curtain ( $\pm$  40 feet tall) is very difficult to maintain, anchors drift with current.
5. Loss of existing CDF "D" storage capacity.

### JUSTIFICATION:

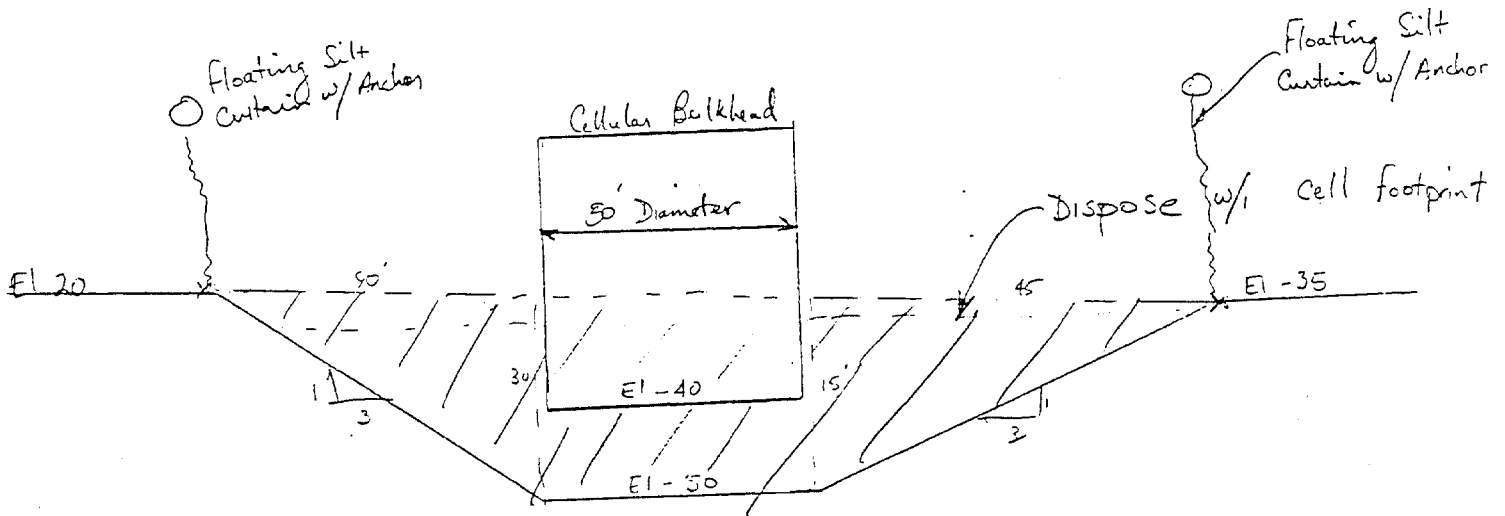
There are tremendous logistics and cost advantages to disposal on-site within CDF "D". However there are practical considerations of getting a silt curtain to work effectively to contain suspended contaminants. This may be possible considering this is a very low velocity area. These difficulties must be overcome to make this a viable proposal.

## VALUE ENGINEERING PROPOSAL

PROPOSAL NO: C-04

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DRAWING NO. 1





## COST ESTIMATE WORKSHEET

PROPOSAL NO.: C-04

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## DELETIONS

	ITEM	UNITS	QUANTITY	UNIT COST	TOTAL
**	Disposal of dredged material	CY	200,000	\$90.00	\$18,000,000
			Total Deletions		\$18,000,000

## ADDITIONS

ITEM	UNITS	QUANTITY	UNIT COST	TOTAL
Silt curtain with anchors	LF	16,000	\$40.00	\$640,000
Silt curtain maintenance	LS	1	\$50,000	\$50,000
Chain anchors	LF	16,000	\$2.00	\$32,000
Install anchor poles	EA	160	\$2,000	\$320,000
Deploy curtain	LS	1	\$10,000	\$10,000
Total Additions				\$1,052,000
Net Savings				\$16,948,000
*	Markups		84.00%	\$14,236,320
Total Savings				\$31,184,320

\* Markups include: 25% contingency, plus 40% (OH, fee, S&A, SS&H, QC, etc.) plus 5% escalation

\*\* \$ 60/ton x 1.5 ton/cy = \$ 90/cy, based on subtitle D disposal

## VALUE ENGINEERING PROPOSAL

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PROPOSAL NO:	C-05	PAGE NO:	1 OF 6
DESCRIPTION:	Build Interior Containment Dike within CDF "D", Rollover Pre-Dredge and Contaminant Layer into Containment Area		

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### ORIGINAL DESIGN:

Foundation materials, both contaminated layer and pre-dredge, for cellular sheet-pile bulkhead wall will be excavated , transported and disposed at an offsite landfill (See Drawing No 1).

### PROPOSED DESIGN:

As installation of cellular sheet-pile bulkhead progresses, begin construction of an interior compartment by placing an adjacent earthen containment dike within CDF "D". Material from the foundation of the first 1400 (approximate) feet of cellular wall will be temporarily stored on site and later relocated into the interior compartment. Size of this interior compartment will be approximately 650 feet x 400 feet x 25 feet average depth. Assuming 3 feet freeboard , this will provide a containment area approximately 22 feet deep. Continue dredging of the foundation for the rest of the bulkhead and place this pre-dredge material and contaminant layer from the footprint of the cellular wall directly into the interior compartment. Reduced capacity within the original CDF "D" footprint, total of 240,000 cy is compensated for in this proposal by moving the harbor side wall approximately 150 feet harborward, thereby increasing the size of the CDF (See Drawing No 2).

**Basis of estimate is that 200,000 cubic yards of total pre-dredge and contaminated quantity (estimated 16,000 cy contaminated and balance being foundation pre-dredge) will be disposed in the compartment.**

Estimate provides cost comparison to disposal at Subtitle D landfill.

### ADVANTAGES:

1. Material from the foundation of the cellular wall, pre-dredge and contaminated, will be disposed within the CDF.
2. Reduces offsite storage or disposal costs for foundation materials.
3. Reduces transportation/haul costs.
4. Reduced traffic in transporting of materials offsite.
5. Reduced fuel expenditure and transportation pollution.
6. Conserves landfill space at original disposal site.

## VALUE ENGINEERING PROPOSAL

PROPOSAL NO: C-05

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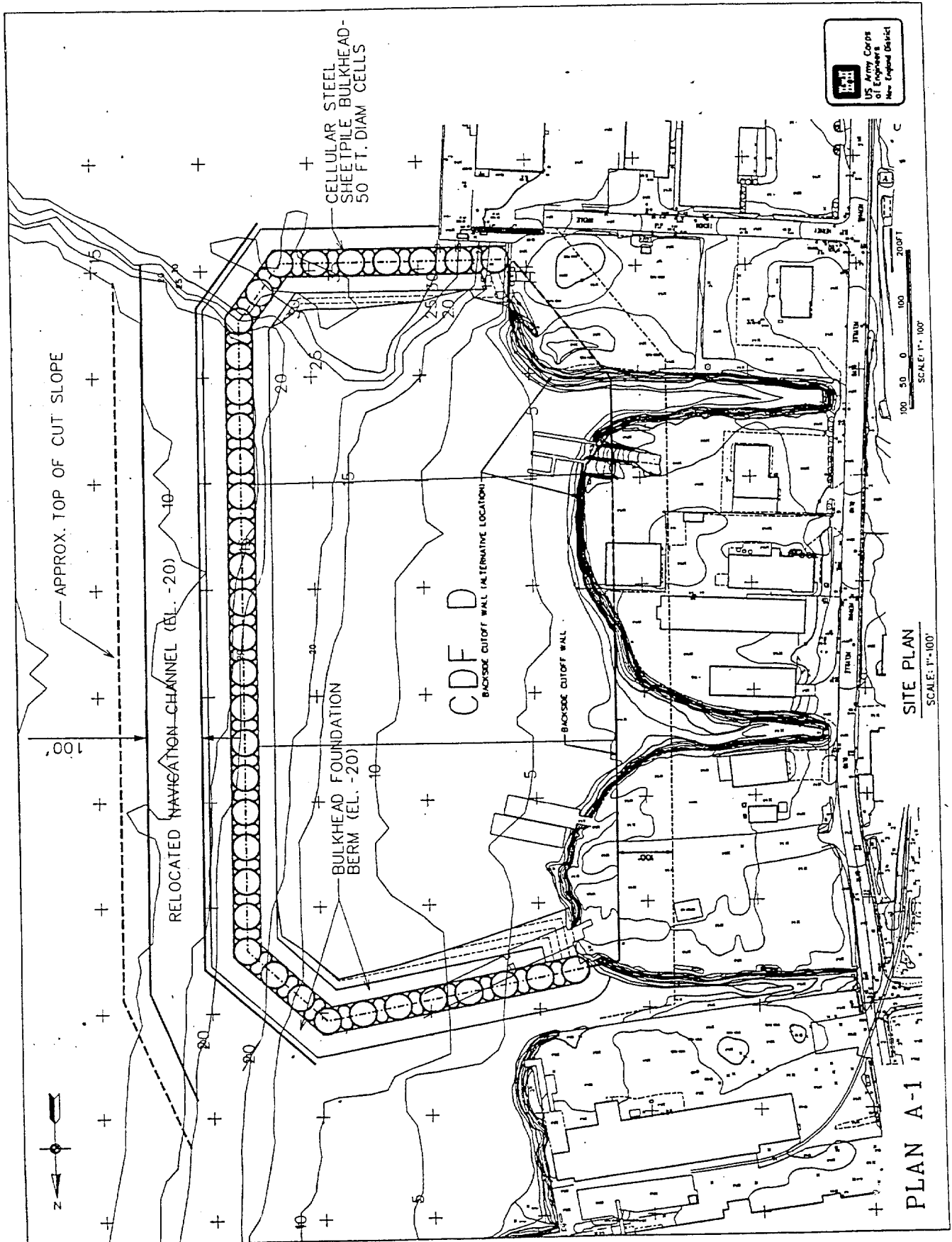
### DISADVANTAGES:

Moving CDF toward channel may increase navigation channel dredging and be politically unacceptable.

### JUSTIFICATION:

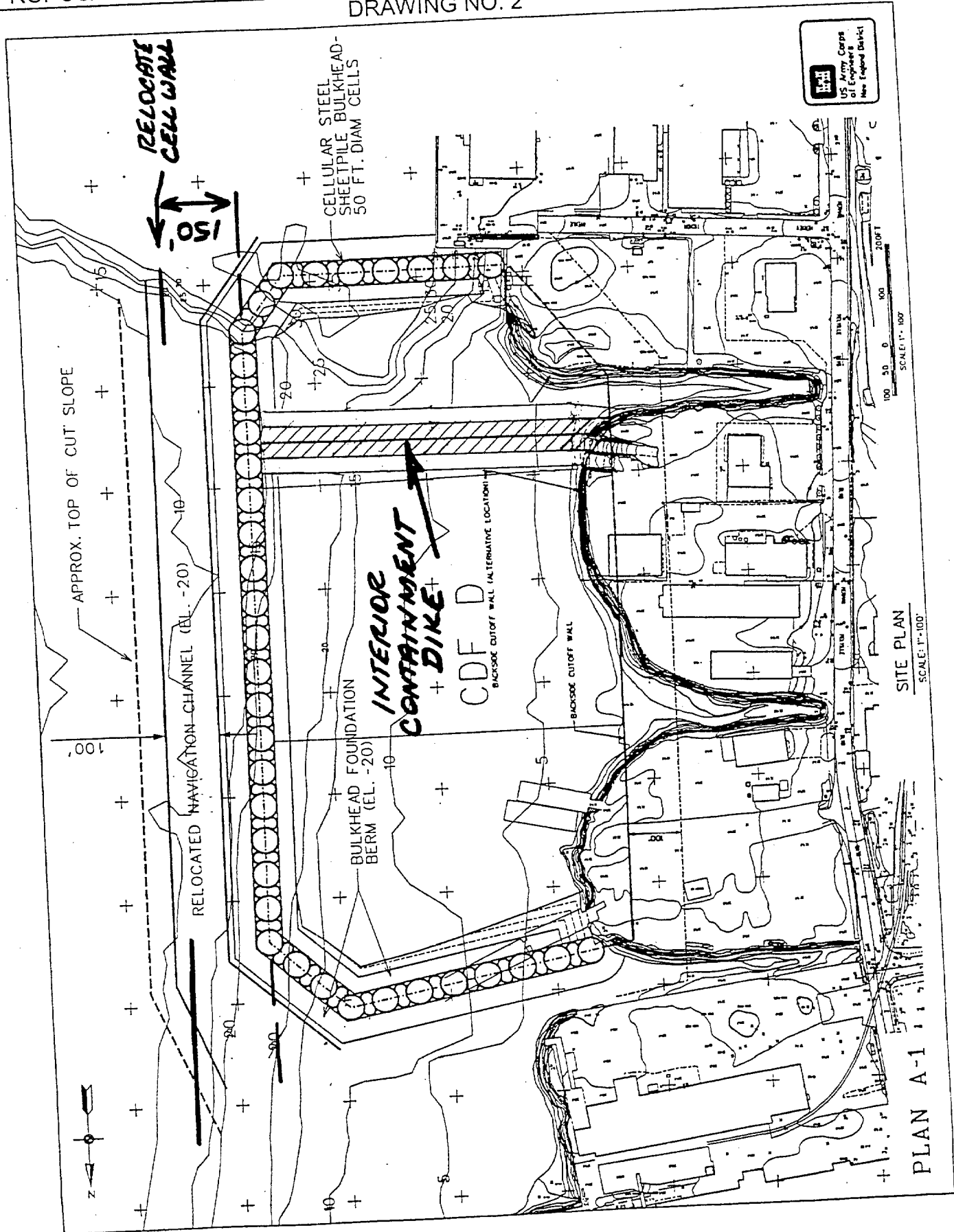
Construction of an interior compartment can be done concurrently with cellular wall construction. Material from the initial 1400 (approximate) feet of cellular wall foundation can be temporarily stored on site in the swales or other location, and relocated back into the compartment. Cellular wall foundation material, both contaminated and pre-dredge, will be moved a short distance and placed within the compartment of CDF "D". Offsite transportation or disposal costs will be reduced.

Intent of this proposal is to demonstrate that increasing the size of CDF "D" and disposal of foundation materials within the CDF footprint is more cost effective than disposal off-site. Further enlargement of CDF is required to accept more on-site disposal quantity without loss of design volume. Proposals C-16 and C-17 demonstrate two off-site disposal scenarios that are more expensive than disposing within CDF "D".



PROPOSAL NO: C-05

DRAWING NO. 2



PLAN A-1

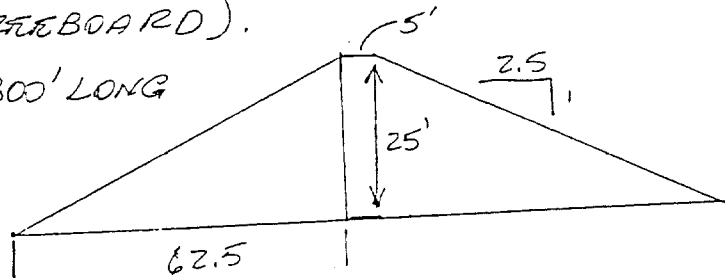
SITE PLAN  
SCALE: 1"=100'

PROPOSAL NO: C-05

CALCULATIONS

ASSUME AVERAGE CONTOUR 15',  
DIKE HEIGHT 25' (INCLUDES 3'  
FREEBOARD).

\* DIKE 800' LONG



$$\begin{aligned}
 \text{VOLUME} \quad & 25 \times 5 = 125 \\
 & 25 \times 62.5 = 1562.5 \\
 & 1687.5 \times 800' = \\
 & 13,500,000 \text{ CF} = \\
 & \frac{13,500,000}{27} = \\
 & 500,000 \text{ C.Y.}
 \end{aligned}$$

HALF VOLUME OF DIKE IN COMPARTMENT

$$\begin{aligned}
 \text{VOLUME TO BE STORED} \quad & 200,000 \text{ cy} \\
 & + 25,000 \text{ DIKE } \frac{1}{2} \\
 & \hline
 & 225,000 \text{ cy}
 \end{aligned}$$

SIZE FOOTPRINT

$$\frac{225,000 \times 27}{22 \times 800} = 345' \text{ WIDE}$$

ADDITIONAL CDF CAPACITY REQUIRED

250,000 cy. HEIGHT @ HARBOR  
WALL 30'. WALL LENGTH ~ 1500'

$$\frac{250,000 \times 27}{30 \times 1500} = 150' \text{ MOVE TOWARD HARBOR}$$

\* (ORIGINAL WIDTH 650' + 150' MOVE =  
800' DIKE



## VALUE ENGINEERING PROPOSAL

PROPOSAL NO:	C-06	PAGE NO:	1 OF 9
DESCRIPTION:	Use 3 or 4 CDF's to Store Dredged Harbor and Foundation Materials, No Lobe Excavation, No Upland Storage		

### ORIGINAL DESIGN:

Plan "A2A" – Use original CDF "D" alignment to elevation 13, build CDF's "A", "B", and "C", excavate lobes for upland dikes (16,000 cubic yards), no de-watering, and build 3 upland storage sites to contain excess material (136,000 cubic yards in Pierce Mill and the Railroad Yard with 239,000 cubic yards in Marsh Island).  
(See Drawing No. 1).

### PROPOSED DESIGN:

De-water harbor but not foundation materials and use 3 or 4 CDF's for storage (This plan does not require off-site storage). Use CDF "D" original alignment elevation 13 (744,000 cubic yards, no lobe excavation).

"G1", Option 1: No material process. Use all 4 CDF's ("A", "B", "C", and "D") with 35,000 cubic yards extra storage.

"G2", Option 1: Process inorganics. Use 3 CDF's ("A", "C", and "D").

Storage requirements "G1", Option 1: 389,000 cubic yards harbor plus 404,000 cubic yards foundation x 1.4 bulking factor = 955,000 cubic yards.

Storage requirements "G2", Option 1: 955,000 cubic yards minus processed/re-used sand @ 53,000 cubic yards = 902,000 cubic yards.

Storage Capacity "G1", Option 1: (744,000 at "D", 110,000 at "C", 71,000 at "A", 65,000 at "B") = 990,000 cubic yards total.

Storage Capacity "G2", Option 1: (744,000 at "D", 110,000 at "C", 71,000 at "A") = 925,000 cubic yards total.

"G1", Option 2 and "G2", Option 2 use the same plan as Option 1, with the assumptions that either the material excavated for the CDF D foundation is not clean, and/or the 3 upland sites (Pierce Mill, RR Yard, Marsh Island) are not available/feasible for storage, therefore requiring higher cost for off-site disposal at the Subtitle D landfill. Assume excavated material for foundation is de-watered then hauled to the Subtitle D landfill in lieu of to 3 upland sites nearby project.

NOTE: New alignment is not large enough to handle storage requirements therefore used original alignment for CDF "D".

\*Drop CDF "B" at 2,000 lineal feet, use CDF "A" at 1,400 lineal feet.

(See Drawing Nos. 2 and 3).



## VALUE ENGINEERING PROPOSAL

PROPOSAL NO: C-06

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### ADVANTAGES:

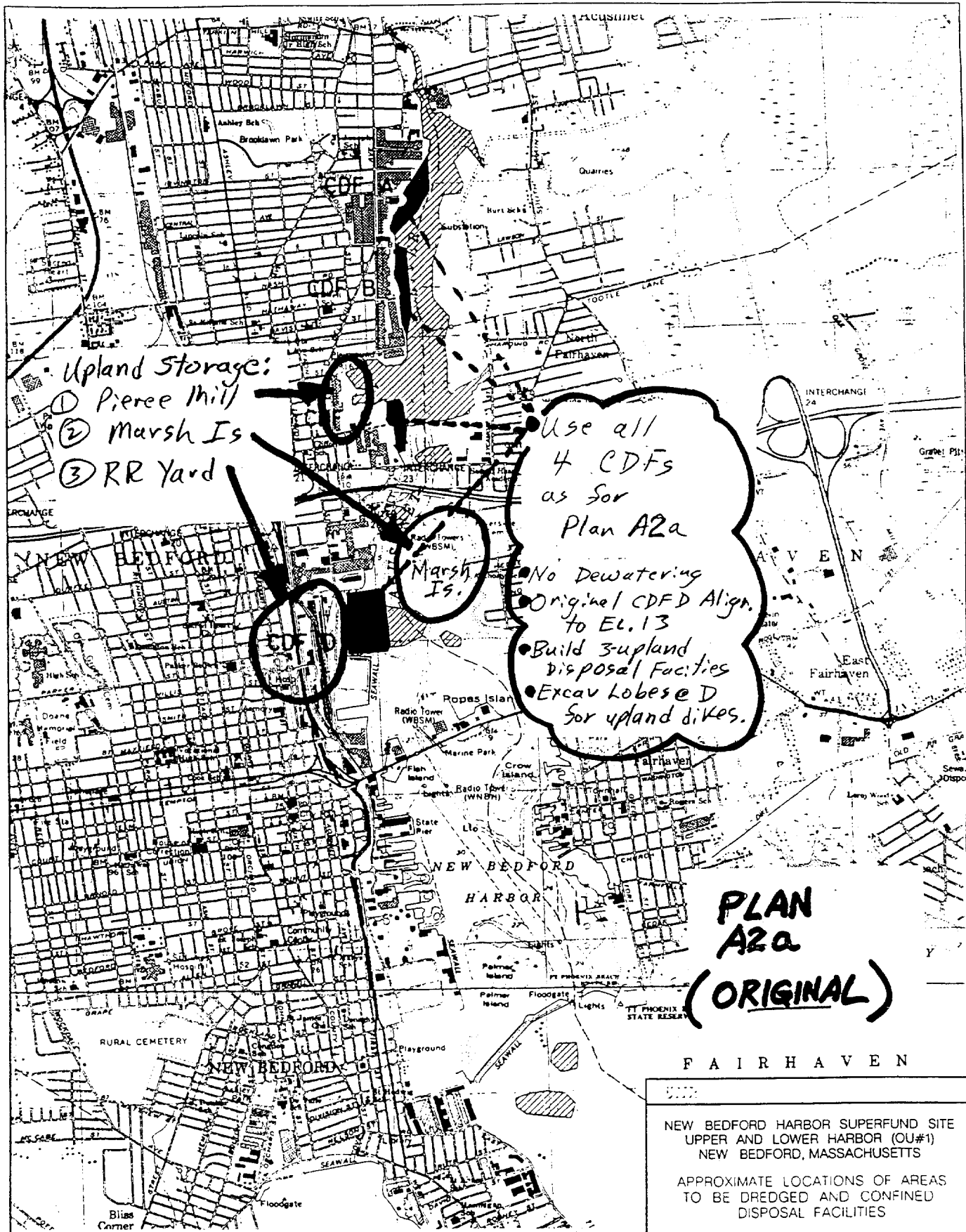
1. Eliminates upland storage which has high degree of uncertainty in available sites and potential public opposition and schedule delays.
2. Eliminates lobe excavation which may be highly contaminated and unsuitable fill.
3. Greater control of feasibility of plan with less risk and uncertainty
4. Most of CDF "D" can be filled with de-watered material resulting in faster consolidation which saves 1 to 2 years to install final cap, complete project and eliminate interior wall needs.

### DISADVANTAGES:

Some uncertainty in dewatering processes and costs

### JUSTIFICATION:

If the original plan remains viable ("A2A"), then "G1", Option 1 and "G2", Option 1 are not economically feasible. If CDF D foundation material is not clean, then upland disposal at 3 nearby sites is not feasible, requiring that Subtitle D landfills and dewatering be used as per the original plan – thus "G1", Option 2 and "G2", Option 2 would be viable. (Savings for "G1", Option 2 = \$11 million, "G2", Option 2 = \$26 million).



# VALUE ENGINEERING PROPOSAL

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DRAWING NO. 2

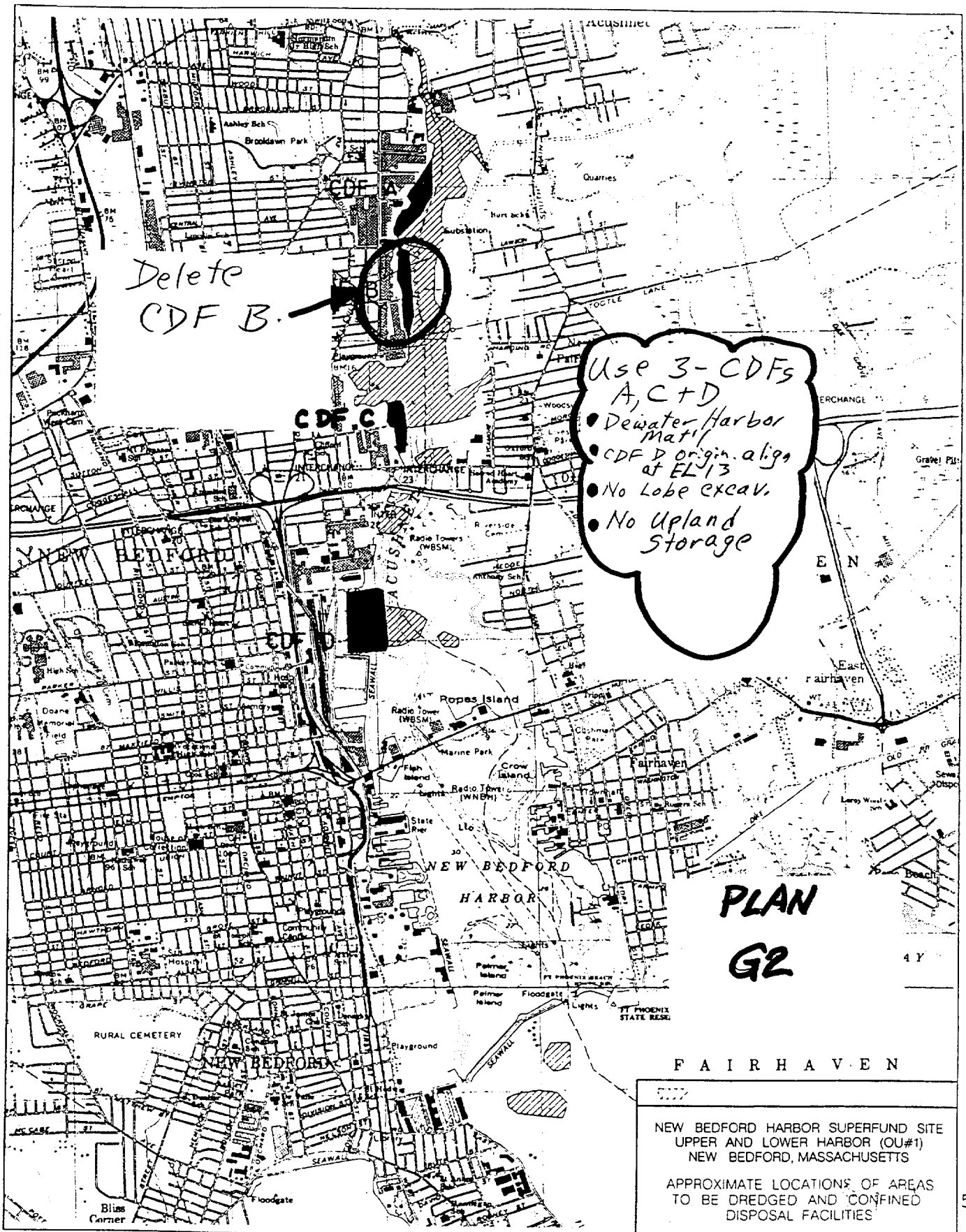


# VALUE ENGINEERING PROPOSAL

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DRAWING NO. 3



COST ESTIMATE WORKSHEET				
ESTIMATE "G1", Option 1				
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DELETIONS				
ITEM	UNITS	QUANTITY	UNIT COST	TOTAL
Plan "A2A"				
Build 3 upland disposal sites	LS	1	\$1,058,000.00	\$1,058,000
Spread and dry at 3 sites	LS	1	\$1,326,000.00	\$1,326,000
Lobe excavation	CY	16,000	\$18.00	\$288,000
Upland site real estate	LS	1	\$1,000,000.00	\$1,000,000
Interior wall backfill and sheet pile	LS	1	\$2,780,000.00	\$2,780,000
Excavation of interior wall: organic	CY	17,000	\$8.00	\$136,000
Excavation of interior wall: inorganic	CY	33,000	\$8.00	\$264,000
Excavation of interior wall: sand	CY	17,000	\$16.50	\$280,500
Move surcharge piles/consolidation	YR	1.5	\$2,500,000.00	\$3,750,000
Process inorganics for sand	CY	178,000	\$20.00	\$3,560,000
De-water/handle/stockpile sand	CY	34,000	\$15.00	\$510,000
Chemical testing unsuitable material disposed	LS	1	\$1,512,000.00	\$1,512,000
50% contingency on above subtotal	LS	1	\$8,232,000.00	\$8,232,000
Total Deletions				\$24,696,500
ADDITIONS				
ITEM	UNITS	QUANTITY	UNIT COST	TOTAL
Plan "G1", Option 1				
** De-water harbor material	CY	777,000	\$20.00	\$15,540,000
De-water CDF "D"	LS	1	\$500,000.00	\$500,000
Buildings for de-watering	EA	2	\$365,000.00	\$730,000
Slurry shoreline cut-off wall to de-water	LS	1	\$3,948,000.00	\$3,948,000
Backfill foundation for wall	CY	28,000	\$30.00	\$840,000
Purchase material for wetlands	CY	300,000	\$10.00	\$3,000,000
25% contingency on above subtotal	LS	1	\$7,694,000.00	\$7,694,000
Total Additions				\$32,252,000
Net Cost INCREASE				\$7,555,500
* Markups			47.00%	\$3,551,085
Total Cost INCREASE				\$11,106,585
* Markups include 40% OH, fee, S&A, SS&H, QC, etc. + 5% escalation				
** 777,000 cubic yards in-situ quantity				

COST ESTIMATE WORKSHEET				
ESTIMATE "G2", Option 1				
PROPOSAL NO.: C-06			PAGE 7 OF 9	
DELETIONS				
ITEM	UNITS	QUANTITY	UNIT COST	TOTAL
Plan "A2A"				
Build 3 upland disposal sites	LS	1	\$1,058,000.00	\$1,058,000
Spread and dry at 3 sites	LS	1	\$1,326,000.00	\$1,326,000
Lobe excavation	CY	16,000	\$18.00	\$288,000
Upland site RE	LS	1	\$1,000,000.00	\$1,000,000
Interior wall backfill and sheet pile	LS	1	\$2,780,000.00	\$2,780,000
Excavation of interior wall: organic	CY	17,000	\$8.00	\$136,000
Excavation of interior wall: inorganic	CY	33,000	\$8.00	\$264,000
Excavation of interior wall: sand	CY	17,000	\$16.50	\$280,500
Move surcharge piles/consolidation	YR	1.5	\$2,500,000.00	\$3,750,000
Process inorganics for sand	CY	178,000	\$20.00	\$3,560,000
De-water/handle/stockpile sand	CY	34,000	\$15.00	\$510,000
Chemical testing unsuitable material	LS	1	\$1,512,000.00	\$1,512,000
50% contingency on above subtotal	LS	1	\$8,232,000.00	\$8,232,000
Plus CDF "B" with contingency	LS	1	\$21,600,000.00	\$21,600,000
Total Deletions			\$46,296,500	
ADDITIONS				
ITEM	UNITS	QUANTITY	UNIT COST	TOTAL
Plan "G2", Option 1				
** De-water harbor material	CY	777,000	\$20.00	\$15,540,000
De-water CDF "D"	LS	1	\$500,000.00	\$500,000
Buildings for de-watering	EA	2	\$365,000.00	\$730,000
Slurry shoreline cut-off wall to de-water	LS	1	\$3,948,000.00	\$3,948,000
Backfill foundation for wall	CY	28,000	\$30.00	\$840,000
Purchase material for wetlands	CY	300,000	\$10.00	\$3,000,000
25% contingency on above subtotal	LS	1	\$7,694,000.00	\$7,694,000
Process inorganics	CY	145,000	\$20.00	\$2,900,000
Less re-use sand	CY	25,000	-\$12.00	-\$300,000
30% contingency on above two items	LS	1	\$780,000.00	\$780,000
Total Additions			\$35,632,000	
Net Cost SAVINGS			\$10,664,500	
* Markups			47.00%	\$5,012,315
Total Cost SAVINGS			\$15,676,815	
* Markups include 40% OH, fee, S&A, SS&H, QC, etc. + 5% escalation				
** 777,000 cubic yards in-situ quantity				

COST ESTIMATE WORKSHEET				
ESTIMATE "G1", Option 2				
PROPOSAL NO.: C-06			PAGE 8 OF 9	
DELETIONS				
ITEM	UNITS	QUANTITY	UNIT COST	TOTAL
Plan "A2A"				
** Dispose Subtitle D landfill	CY	162,000	\$90.00	\$14,580,000
*** De-water Subtitle D landfill	CY	324,000	\$20.00	\$6,480,000
Build 3 upland disposal sites	LS	0	\$1,058,000.00	\$0
Spread and dry at 3 sites	LS	0	\$1,326,000.00	\$0
Lobe excavation	CY	16,000	\$18.00	\$288,000
Upland site real estate	LS	0	\$1,000,000.00	\$0
Interior wall backfill and sheet pile	LS	1	\$2,780,000.00	\$2,780,000
Excavation of interior wall: organic	CY	17,000	\$8.00	\$136,000
Excavation of interior wall: inorganic	CY	33,000	\$8.00	\$264,000
Excavation of interior wall: sand	CY	17,000	\$16.50	\$280,500
Move surcharge piles/consolidation	YR	1.5	\$2,500,000.00	\$3,750,000
Process inorganics for sand	CY	178,000	\$20.00	\$3,560,000
De-water/handle/stockpile sand	CY	34,000	\$15.00	\$510,000
Chemical testing unsuitable material	LS	1	\$1,512,000.00	\$1,512,000
25% contingency on above subtotal	LS	1	\$9,183,000.00	\$9,183,000
Total Deletions			\$43,323,500	
ADDITIONS				
ITEM	UNITS	QUANTITY	UNIT COST	TOTAL
Plan "G1", Option 2				
**** De-water harbor material	CY	777,000	\$20.00	\$15,540,000
De-water CDF "D"	LS	1	\$500,000.00	\$500,000
Buildings for de-watering	EA	2	\$365,000.00	\$730,000
Slurry shoreline cut-off wall to de-water	LS	1	\$3,948,000.00	\$3,948,000
Backfill foundation for wall	CY	28,000	\$30.00	\$840,000
Purchase material for wetlands	CY	300,000	\$10.00	\$3,000,000
25% contingency on above subtotal	LS	1	\$7,694,000.00	\$7,694,000
Total Additions			\$32,252,000	
Net Cost SAVINGS			\$11,071,500	
* Markups			47.00%	\$5,203,605
Total Cost SAVINGS			\$16,275,105	
* Markups include 40% OH, fee, S&A, SS&H, QC, etc. + 5% escalation				
** 324,000 cubic yards @ 50%, \$60/ton x 1.5 ton/cubic yard				
*** 324,000 cubic yards in-situ quantity				
**** 777,000 cubic yards in-situ quantity				

COST ESTIMATE WORKSHEET				
ESTIMATE "G2", Option 2				
PROPOSAL NO.: C-06			PAGE 9 OF 9	
DELETIONS				
ITEM	UNITS	QUANTITY	UNIT COST	TOTAL
Plan "A2A"				
** Dispose Subtitle D landfill	CY	162,000	\$90.00	\$14,580,000
*** De-water Subtitle D landfill	CY	324,000	\$20.00	\$6,480,000
Build 3 upland disposal sites	LS	0	\$1,058,000.00	\$0
Spread and dry at 3 sites	LS	0	\$1,326,000.00	\$0
Lobe excavation	CY	16,000	\$18.00	\$288,000
Upland site real estate	LS	0	\$1,000,000.00	\$0
Interior wall backfill and sheet pile	LS	1	\$2,780,000.00	\$2,780,000
Excavation of interior wall: organic	CY	17,000	\$8.00	\$136,000
Excavation of interior wall: inorganic	CY	33,000	\$8.00	\$264,000
Excavation of interior wall: sand	CY	17,000	\$16.50	\$280,500
Move surcharge piles/consolidation	YR	1.5	\$2,500,000.00	\$3,750,000
Process inorganics for sand	CY	178,000	\$20.00	\$3,560,000
De-water/handle/stockpile sand	CY	34,000	\$15.00	\$510,000
Chemical testing unsuitable material	LS	1	\$1,512,000.00	\$1,512,000
25% contingency on above subtotal	LS	1	\$9,183,000.00	\$9,183,000
Plus CDF "B" with contingency	LS	1	\$21,600,000.00	\$21,600,000
Total Deletions				\$64,923,500
ADDITIONS				
ITEM	UNITS	QUANTITY	UNIT COST	TOTAL
Plan "G2", Option 2				
**** De-water harbor material	CY	777,000	\$20.00	\$15,540,000
De-water CDF "D"	LS	1	\$500,000.00	\$500,000
Buildings for de-watering	EA	2	\$365,000.00	\$730,000
Slurry shoreline cut-off wall to de-water	LS	1	\$3,948,000.00	\$3,948,000
Backfill foundation for wall	CY	28,000	\$30.00	\$840,000
Purchase material for wetlands	CY	300,000	\$10.00	\$3,000,000
25% contingency on above subtotal	LS	1	\$7,694,000.00	\$7,694,000
Process inorganics	CY	145,000	\$20.00	\$2,900,000
Less re-use sand	CY	25,000	-\$12.00	-\$300,000
30% contingency on above two items	LS	1	\$780,000.00	\$780,000
Total Additions				\$35,632,000
Net Cost SAVINGS				\$29,291,500
* Markups			47.00%	\$13,767,005
Total Cost SAVINGS				\$43,058,505
* Markups include 40% OH, fee, S&A, SS&H, QC, etc. plus 5% escalation				
** 324,000 cubic yards @ 50%, \$60/ton x 1.5 ton/cubic yard				
*** 324,000 in-situ quantity				
**** 777,000 cubic yards in-situ material				



## VALUE ENGINEERING PROPOSAL

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PROPOSAL NO:	C-07	PAGE NO:	1 OF 15
DESCRIPTION:	Use CDF "D" with "New" Alignment to Avoid Channel Relocation, Delete "A", "B", and "C", De-water Harbor Sediments, Delete Upland Storage Sites		

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### ORIGINAL DESIGN:

"D2": Build CDF "D" to elevation 10.5 using a cellular bulkhead, but using the "new" reduced footprint alignment to avoid relocating the 20-foot navigation channel. De-water harbor sediments but not the "pre-dredged material". Three upland sites would be used to store these.

### PROPOSED DESIGN:

Plan H: Eliminate all three upland sites by de-watering the "pre-dredging" foundation material as well as the harbor sediments.

Plan H1, Option 1: Build CDF "D" to elevation 13 (new alignment), build CDF "C" to store 50,000 cubic yards and have 60,000 cubic yards capacity in reserve. No upland sites.

Plan H2, Option 1: Build CDF "D" new alignment to elevation 16. De-water both harbor and foundation sediments. No other CDF's or upland sites.

Plan H3, Option 1: Same as H1 but send the extra 50,000 cubic yards of de-watered pre-dredging materials to an off site Subtitle D landfill instead of building CDF "C".

Plan H4, Option 1: Build the original 20-acre alignment of CDF "C" to elevation 10.5. No other sites or CDF's.

Option 2 uses the same plan as Plans H1 through H4, Option 1, with the assumption that CDF D foundation material is not clean, requiring higher cost for off-site disposal at a Subtitle D landfill.

### ADVANTAGES:

Eliminates cost and schedule impacts of the 3 upland disposal sites, as well as the uncertainty that any of the 3 sites could in fact be implemented.

### DISADVANTAGES:

1. Cost of de-watering foundation materials.
2. Plan H2: Uncertainty of impact of elevation 16 wall on Modal Facility.
3. Plan H1: May end up with 60,000 cubic yards of unused CDF volume (could be used for navigational dredging through linkage).

## VALUE ENGINEERING PROPOSAL

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PROPOSAL NO:	C-07	PAGE NO: 2 OF 15
DESCRIPTION:	Use CDF "D" with "New" Alignment to Avoid Channel Relocation, Delete "A", "B", and "C", De-water Harbor Sediments, Delete Upland Storage Sites	

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### JUSTIFICATION:

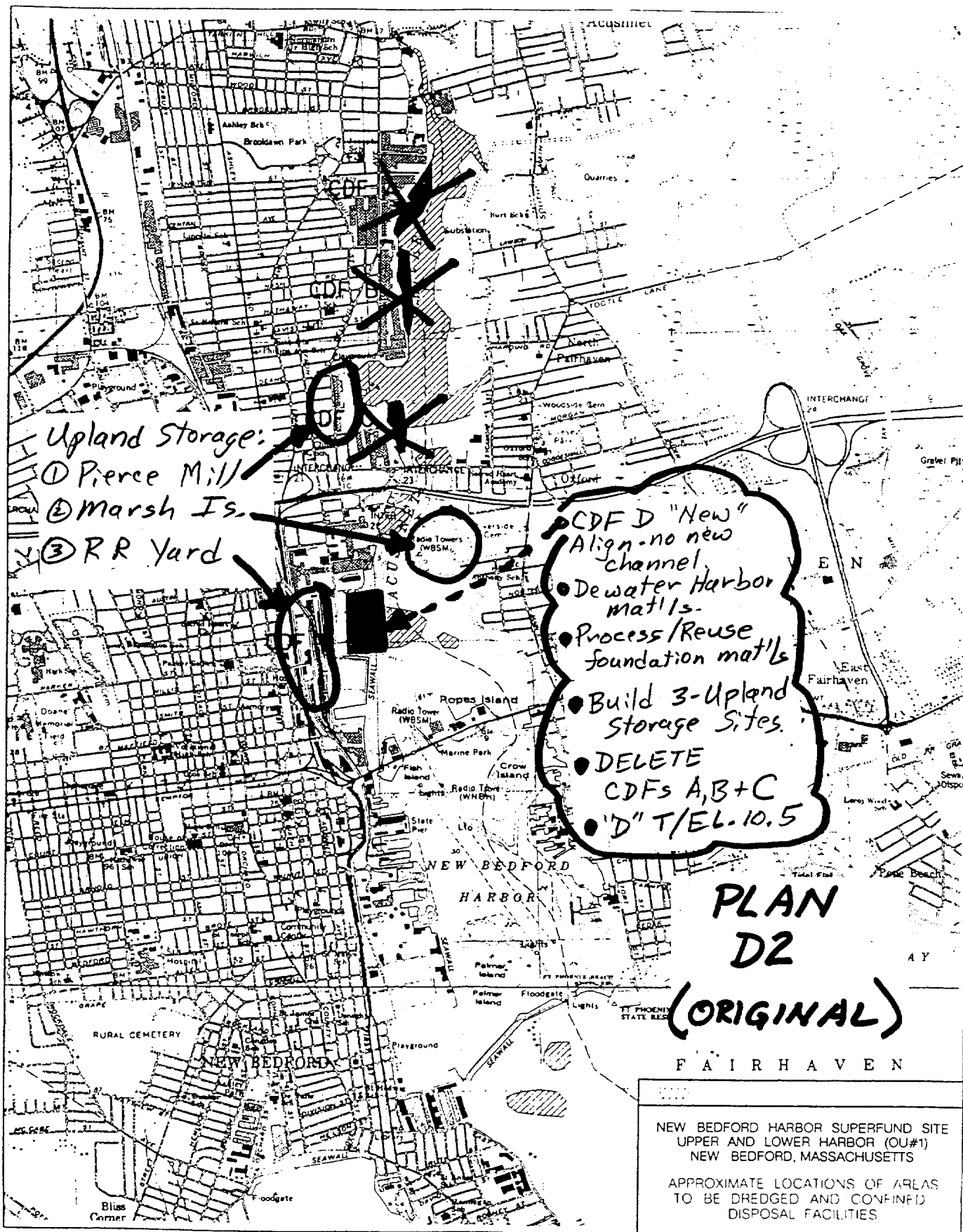
It may be unrealistic to assume implementability of the 3 upland sites. H1: Extra capacity available for excavation of foundation at CDF "C". Avoids CWA 404 issues since the plan would not be backfilling foundation material into excavated wetlands or mudflats. There are no savings with Option 1, Plans H1, H2, H3, or H4 unless the Option 2 situation should exist where upland storage sites are not feasible and all material from foundations would go to a Subtitle D landfill; then Plan H2 would be cost effective and most feasible.

# VALUE ENGINEERING PROPOSAL

PROPOSAL NO: C-07

PAGE NO: 3 OF 15

DRAWING NO. 1

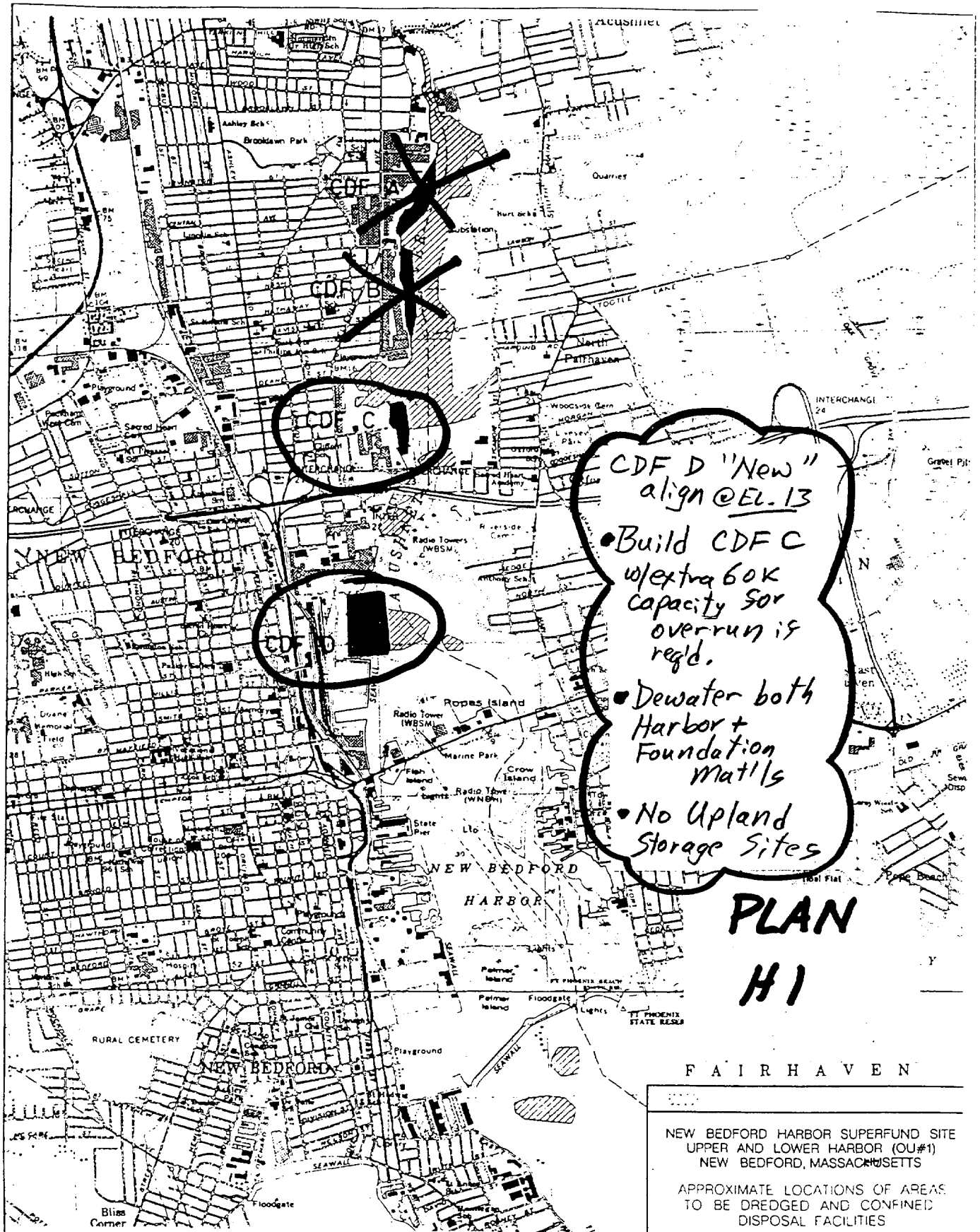


# VALUE ENGINEERING PROPOSAL

PROPOSAL NO: C-07

PAGE NO: 4 OF 15

DRAWING NO. 2



PAGE NO: 5 OF 15

CDF A

CDF B

CDF C

CDF D

CDF D New align  
@ EL 16  
• Dewater both  
Harbor + Found.  
mat'ls  
• No Upland Storage

PLAN  
H2

NEW BEDFORD HARBOR

FAIRHAVEN

NEW BEDFORD

NEW BEDFORD HARBOR SUPERFUND SITE  
UPPER AND LOWER HARBOR (OU#1)  
NEW BEDFORD, MASSACHUSETTS

APPROXIMATE LOCATIONS OF AREAS  
TO BE DREDGED AND CONFINED  
DISPOSAL FACILITIES